Combined novel approaches to the microscopic study of dental implant site cores.

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Healthy connective tissues are covered and protected by an epithelium. The single unavoidable exception concerns cementum and dentine at the neck of a tooth after the epithelial attachment migrates past the enamel. Carious lesions break this barrier and microbial invasion via dentine and pulp leads to pulpitis, osteomyelitis and extraction. Similarly, tooth loss from periodontal disease may leave infected bone. Dental implants may thus be placed in prejudiced bone. In the context of this symposium, therefore, the peri-implant disease may be nucleated before the outset. In addition, implants breach the epithelial barrier and lack the essential perio(*donta*l)implant membrane which is key to the success of gomphosis as a means of attaching teeth.

We chose to investigate cores deriving from implant placement to examine bone quality. We studied trephine samples from 252 sites in 35 patients from KW's practice, all with patient consent and local ethical committee approval. The sites were 'native cores' where implants were placed at the first operation and those where a sinus graft procedure had been performed approximately six months beforehand. Samples were fixed in 70% ethanol, embedded in PMMA, and resulting blocks studied by quantitative backscattered electron imaging (qBSE-SEM) and correlated X-ray microtomography (XMT). Later, we introduced iodine staining for BSE SEM to read soft tissue and cellular histology. Here, untoward findings concern the routinely abnormal bone marrow histology in the implant zone; an instance of low grade osteomyelitis; respiratory, nasal epithelial glandular elements in sinus graft cores; and osteomalacia.

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